

App. No. 10/608,295
Office Action Dated February 21, 2006

REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and the following remarks. Claims 1 and 13 are hereby amended. Claim 20 is new and is drawn to the elected invention.

Amendment of claim 1 is supported by Figure 1. Withdrawn claim 13 is amended to track with claim 1. New claim 20 is supported by page 9, line 36 to page 10, line 3.

Claims 1, 3, 5-8, and 11 were rejected as being anticipated by Nguyen (US 6,707,140). Applicants traverse this rejection. Nguyen does not disclose or suggest a semiconductor device including an encapsulation resin layer that is formed so that at least a surface of a first semiconductor chip opposite to a surface on which a circuit is formed and a portion adjacent to an opposite surface in each of side surfaces of the first semiconductor chip are exposed to the outside of the encapsulation resin layer and the surface on which the circuit is formed and a remaining portion in each of the side surfaces are covered with the encapsulation resin layer, as required by claim 1. Rather, Nguyen teaches a semiconductor device including a resin layer (underfill material 160 and molding material 135) that is formed between an upper semiconductor chip (155) and a lower semiconductor chip (110). Only the circuit surface of the upper semiconductor (155) of the semiconductor device is covered with the resin layer (160, 135). In fact, side surfaces of the upper semiconductor chip (155) are completely exposed. See Figure 1.

In contrast, the semiconductor device of claim 1 requires that the circuit surface and the lower portion of each of the side surfaces are encapsulated in the encapsulation resin. The claimed encapsulation resin exhibits higher retention with respect to the first semiconductor chip (upper semiconductor chip) without compromising heat dissipation, than that provided by a semiconductor device taught by Nguyen. Adequate retention provides a highly reliable semiconductor device.

Favorable reconsideration of claims 1, 3, 5-8, and 11 is requested.

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Claims 2, 4, and 12 were rejected as being unpatentable over Nguyen in view of Hikita (US 6,133,637). Applicants traverse this rejection. Claims 2, 4, and 12 should be considered allowable for at least the same reasons as claim 1, from which they depend. Applicants are not conceding the correctness of the rejection as applied to the rejected claims. Favorable reconsideration of claims 2, 4, and 12 is requested.

Claims 9 and 10 were rejected as being unpatentable over Nguyen in view of Pu (US 6,610,560). Applicants traverse this rejection. Claims 9 and 10 should be considered allowable for at least the same reasons as claim 1, from which they depend. Applicants are not conceding the correctness of the rejection as applied to the rejected claims. Favorable reconsideration of claims 9 and 10 is requested.

New claim 20 should be considered allowable for at least the same reasons as claim 1, from which it depends. Further, Nguyen does not disclose or suggest a semiconductor device wherein each of the first semiconductor chip and the second semiconductor chip comprises a plurality of electrode pads, and each of the electrode pads of the first semiconductor chip is connected to the corresponding electrode pad of the second semiconductor chip via a single bump, as required by new claim 20. Rather, Nguyen teaches a first bump attached to an upper semiconductor chip that in turn is connected to a corresponding second bump attached to a lower semiconductor chip. In order to ensure connection, the first and second bumps need to be aligned in the connecting direction. In contrast, the semiconductor device of claim 20 requires a single bump to connect the electrode pads of the first semiconductor chip and that of the second semiconductor chip. Favorable examination of claim 20 is requested.

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In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions regarding this communication can be directed to the undersigned attorney, Curtis B. Hamre, Reg. No. 29,165, at (612)455-3802.

Respectfully Submitted,



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